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AIR UNIVERSITY

TECHNOLOGY, ORGANIZATION AND DOCTRINE

ENHANCING THE COMBAT CAPABILITY

OF THE ON-CALL AEW

by

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Abstract

The Expeditionary Aerospace Force (EAF) concept and the concurrent revolution in military affairs has introduced to the warfighter a multitude of means to better enable them to accomplish their mission. The Air Expeditionary Wing (AEW), as a part of the Air Expeditionary Force, will become the United States Air Force's quick reacting, on-call fighting force. It is essential that the Air Force leverage capabilities stemming from the revolution in military affairs and its accompanying revolution in military technology to improve the Air Expeditionary Wing's ability to not only react, but also to act.

As the United States Air Force continues to develop the Expeditionary Aerospace Force concept, within the broad guidance of Joint Vision 2010 and Global Engagement, changes to three primary areas will need to take place. The technology, organizational structures and doctrine that the Air Expeditionary Wing incorporates needs to be adapted in light of this Revolution in Military Affairs.

The Air Expeditionary Wing concept will present challenges to orthodox Air Force way of thought. New technologies, combined with new organizational structures demonstrated during recent deployments and Air Force experiments, and the introduction of commander's intent with mission-type orders can revolutionize the On-call AEW. To embrace innovation, one must accept change.

Part 1

The Current Process and The Need For Innovation

"Nothing is harder than putting a new idea into a military mind, except removing the old one"

— B.H. Liddell-Hart

"The Air Tasking Order (ATO) process, with large numbers of aircraft, is a procedural, sequential, rigid process. It is not able to react inside 24 hours, and it's simply an asset management tool."[1] Vice Admiral Daniel J. Murphy, Commander, US Navy Sixth Fleet and NATO Striking and Support Forces, Southern Europe, iterated after Operation Allied Force. He appeared before the Senate Armed Services Sea Power Subcommittee several months after Operations Allied Force, detailing the Navy's role in the operation. Admiral Murphy made several references to Air Force doctrine and the ATO, which brings to light some of the potential problems of the current air tasking process. Admiral Murphy uses the example of Podgorica Airfield to demonstrate the Navy's ability to react quickly. Podgorica Airfield was threatening the introduction of the US Army's Task Force Hawk into Albania because of the very close proximity of the base (30-Miles). It was a Serb airbase and a significant number of Serbian air-to-ground aircraft were moved onto the base. Admiral Murphy relates the story:

> "When we detected that move, General Clark that morning said, 'I have to have that airfield taken out now. We cannot afford a strike, even an ineffective strike, against Task Force Hawk just across the border.' He turned to General Short (Lt. General Michael C. Short, USAF, Joint

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Forces Air Component Commander (JFACC)) and said, 'Can you do it?' and General Short said, 'The Navy can do it.' He (Clark) turned to me and said, 'Dan, can you do it?' and I said, 'Yeah, we can do it."[2]

The Navy put up 48 aircraft within 12 hours and destroyed the airfield. According to Admiral Murphy, "this is what the Navy does. ...This is not, in any way, finding fault with the Air Force. ...Air campaigns are the Air Force's business. If you want to take something out quickly, that's what the Navy is particularly good at, in terms of airpower."[3]

USAF Lt. General Lansford E. Trapp Jr., Vice Commander of Pacific Air Forces, re-iterated the same view in a recent interview in Air Force Magazine:

> "We take a look at what the battlespace is 48 hours from now. And we allocate resources against designated sets of targets. And then we prosecute those in a time-phased manner through this thing called the Air tasking Order. And then we assess what impact that had, and we start the cycle over again. And they overlap with one another, as you know. That's not very dynamic."[4]

But the Air Force is trying to make changes to this process and is in line with the Department of Defense trying to find better, faster, more responsive means of operation.[5] The Department of Defense is embarked on a transformation strategy designed to meet and overcome the obstacles of tomorrow and the challenges of today. This change revolves around the defense strategy itself. The process continues with a deep evaluation of the military missions and tasks that are needed to carry out that strategy.[6] Secretary of Defense Cohen reported to the President and Congress that " the Department's willingness to embrace the Revolution in Military Affairs (RMA)—to harness technology to ultimately bring about fundamental conceptual and organizational change—is critical at this stage of the transformation strategy."[7] Cohen also reported that information superiority is the key.[8] Joint Vision 2010 embraces information superiority and the

technological advances that will transform traditional operational warfighting concepts into new concepts via changes in weapons systems, doctrine, culture and organization.[9] Global Engagement: A Vision for the 21st Century Air Force, the "Air Force's vision into the first Quarter of the 21st Century," states that innovation is the key to the Air Force's ability to meet the challenges shaping the world today.[10] The Air Force is committed to a vigorous program of experimenting, testing, and evaluating new operational concepts and systems for air and space power. The air force must "invigorate the spirit of innovation and creativity that has long been the hallmark of the United States Air Force," and in so doing, make changes that will make aerospace power more adaptive and responsive.[11]

The Air Force's basic challenge today is determining the path it will take throughout the next twenty years. The Expeditionary Air Force concept and the Air Expeditionary Forces embodies the Air Force vision to organize, train, equip and sustain its Total Force to meet the security issues of the 21st century.[12] The Expeditionary Aerospace Force (EAF) concept, tied to the current revolution in military affairs, introduces to the warfighter a multitude of means to better enable them to accomplish their mission. Global Engagement: A Vision for the 21st Century Air Force ensures that the Air Force meets the challenge of the future missions through innovation.[13] Innovation and the acceptance of new ideas is essential to changes in how the Air Force operates.

Key Areas of Change

As United States Air Force continues to develop the Expeditionary Aerospace Force (EAF) concept, within the broad guidance of Joint Vision 2010 and Global Engagement, key areas need to be addressed to enhance the total force structure. At its foundation the EAF concept is about structural and cultural changes to "create more effective

management tools."[14] The Air Expeditionary Forces (AEFs) as a part of the EAF concept, combines with new management policies allowing the Air Force to better schedule units for deployments, make the process more predictable for Air Force members.[15] (See Figure 1)

> "We had to develop a solution that addressed operations tempo and personnel tempo better than the previous system, that solution was the EAF."

> General Ed Eberhart, Former ACC Commander[16]

Figure 1. AEF Cycle

But as the Air Force organizes the majority of its total force into ten Air Expeditionary Forces (AEFs), two dedicated on-call Aerospace Expeditionary Wings (AEWs), and Five Mobility Lead Wings, it is important to note that the EAF concept is not just a personnel issue, especially for the On-call AEWs. As the On-call AEWs provide a crisis response capability to meet time-critical objectives, the current Air Force organization, technology and concepts need to be updated into the 21st Century. The On-call Air Expeditionary Wing concept will present challenges to orthodox Air Force way

of thought. The Air Force must be willing to accept changes in how an Air Expeditionary Wing is tasked and employed so it can accomplish those missions Admiral Murphy believes only the Navy can satisfy.

Three Enablers: Technology, Organization and Doctrine

This paper will address three enablers, technology, organization, and doctrine, when combined enhance the combat responsiveness of the On-call AEW. Before breaking down the three areas, some basic definitions will be introduced to lay the framework for the rest of the paper. After the definitions are laid out, the potential impact of new technologies and the leveraging of the RMA sparked by the leap-ahead advances in information technologies will be addressed. Increasing the ability of the warfighter to access any information detailing the battlespace, from any location, increases the ability of an On-call AEW to rapidly respond to crisis and increase their inherent combat capability.

Tied to any new technologies are new processes or organizational reconfigurations that have the potential to change the very nature on how the Air Force goes to war. These new processes must first be centered on the On-call AEW, due to their current crisis response nature. These new changes are aimed primarily at organizing information to provide understanding to the deploying/deployed AEW Commander. These organizational changes support the AEW and are designed to allow flexibility, centralized command and decentralized execution, and synergism to the command and control structure for the AEW.

The final enabler, which requires changes in doctrine, is the implementation of commander's intent and mission-type orders at the AEW level. The commander's intent

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concept has existed for a long time and is central to major portions of Army, Navy, Marine and Joint publications. The Air Force can profit from a more defined use of commander's intent and mission-type orders. Mature combinations of advanced technologies and innovative operational concepts resulting in changes to Air Force doctrine, the utilization of commander's intent at the on-call AEW level, can significantly enhance the on-call AEW ability to conduct a full range of time critical military operations.

Notes

[1] The Navy in the Balkans. Vice Admiral Daniel J. Murphy. Air Force Magazine. Dec 1999. P48.

[2] The Navy in the Balkans. Vice Admiral Daniel J. Murphy. Air Force Magazine. Dec 1999. P48.

[3] The Navy in the Balkans. Vice Admiral Daniel J. Murphy. Air Force Magazine. Dec 1999. P48.

[4] Joint Experiment in the Expeditionary Force. William H. McMichael. Air Force Magazine. Jan 2000. P49.

[5] The Navy in the Balkans. Vice Admiral Daniel J. Murphy. Air Force Magazine. Dec 1999. P48.

[6] Annual Report to the President and the Congress. William S. Cohen. Secretary of Defense, 1998. http://www.armyec.sra.com/knowbase/newsdoc/doc194/chap13.htm.

Annual Report to the President and the Congress. William S. Cohen. Secretary of Defense, 1998.

[7] Annual Report to the President and the Congress. William S. Cohen. Secretary of Defense, 1998. http://www.armyec.sra.com/knowbase/newsdoc/doc194/chap13.htm.

[8] Annual Report to the President and the Congress. William S. Cohen. Secretary of Defense, 1998. http://www.armyec.sra.com/knowbase/newsdoc/doc194/chap13.htm

[9] Joint Vision 2010. Joint Chiefs of Staff.

[10] Global Engagement: A Vision for the 21st Century Air Force. Department of the Air Force, Washington DC. Pg. i

[11] Global Engagement: A Vision for the 21st Century Air Force. Department of the Air Force, Washington DC. Pg. 9

[12] Expeditionary Aerospace Force, Detail Concept Paper, HQ USAF/XOPE EAF Implementation Division, 1 Oct 99, Pg 1.

[13] Global Engagement: A Vision for the 21st Century Air Force. Department of the Air Force, Washington DC. Pg. 9

[14] Expeditionary Aerospace Force, Detail Concept Paper, HQ USAF/XOPE EAF Implementation Division, 1 Oct 99, Pg 1.

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[15] Expeditionary Aerospace Force, Detail Concept Paper, HQ USAF/XOPE EAF Implementation Division, 1 Oct 99, Pg 1.

[16] Eberhart: EAF on Track, Major J.D. Henson. Air Combat Command Commander's Action Group. Air Force News, 12 Jan 2000. http://www.af.mil/news/jan2000/n20000112_000042.html

Part 2

Definitions

Air Expeditionary Force

Before getting in-depth with some of the key points, it is important to start out with a common foundation. In developing this foundation, definitions are essential. First topic to be discussed is the Expeditionary Aerospace Force (EAF) and next will be commander's intent and mission type orders. The key objective of the EAF vision and expeditionary mindset is force management. General Ryan, Chief of Staff of the United States Air Force, stated it best, "the EAF is what we are. It's how we think about ourselves. It is our culture."[1] While the EAF concept dissects the Air Force into 10 Air Expeditionary Force (AEF) and two On-call AEWs, it is the AEF that makes the final transition from "a force founded on the strategy of forward-based presence to one built on the vision of global engagement."[2] The ten AEFs are sized to meet steady state rotational requirements for forward deployed forces, and the two On-call AEWs provide a crisis response capability to meet other time critical objectives.[3] The AEF represents a specific level of aerospace capabilities: air superiority; suppression of Enemy defenses (SEAD); air-to-ground including bombers and precision munitions; mobility; expeditionary combat support; and tactical leadership.

Pairs of AEFs will fill 90-day eligibility periods during which the inherent units will forward deploy or remain at home in an on-call status. After 90 days the next two AEFs will be placed on-call, relieving the first two. During the eligibility period, AEF units will fill all scheduled combat and combat support deployment requirements throughout the world.[4] The residual forces from these two AEFs will be prepared to respond to crisis. Because of force structure limitations, these residual AEF assets do not provide enough credible offensive response to crisis.[5] Until these shortfalls can be corrected, two "on-call" rapid response AEWs (Mountain Home AFB, ID and Seymour Johnson AFB, NC) will be utilized. These composite AEWs contain all elements required to be a potent strike force. They will rotate on-call status, 90 days on and 90 days off but will not normally deploy unless a crisis occurs. These AEWs must be prepared to deploy and execute missions at a moment's notice. Major General Mark Schmidt, former Commander of the 366th Wing, said it was not unreasonable to expect his aircraft (F-15E, F-15C, F-16, B-1B, and KC-135R) to launch to an AOR within 8 to 24 hours from being notified, dependent on the amount of strategic warning they receive[6]. On-call AEWs are the main emphasis areas to be discussed due to their current requirement for rapid response, and essential inherent characteristics of aerospace power-range, speed, flexibility, and precision. It is this immediate response and execution requirement which is the driving force behind this paper.

Mission-Type Orders

Vice Admiral Murphy gave a perfect example of how the Navy utilizes mission-type orders and how commander's intent is used. In Admiral Murphy's anecdote of the Podgorica strike he talked of General Clark's detail instruction on what must be

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accomplished and for what purpose and was very exact in stating the desired end-state. This command technique directed what to do and why it must be done without specifying how to do it. Army Field Manual 100-5 defines mission orders as the "commander's expression of what the unit must accomplish and for what purpose."[7] A precise, clear mission statement that subordinates can understand throughout the battle is essential to any success in combat. Tied directly to that mission is the intent of the commander. Commander's intent describes the desired end-state. It should be a concise expression of the purpose of the operation, not a summary of the concept of operations. The intent should be able to focus subordinate commanders on the purpose of the operation.

> "The JFC's intent helps subordinates pursue the desired end-state without further orders, even when operations do not unfold as planned"[8]
>
> (Joint Pub 3-0)

Planning for the employment of military forces as a joint team begins with articulating and understanding the objective, purpose for the operations, and the commander's intent delivered through the Joint Forces Commander to the individual component commanders.[9] Commander's intent provides operational and tactical freedom for all subordinate leaders. Army doctrine believes that commander's intent is essential because it permits leaders to act quickly, seize the initiative and facilitate quick and accurate decision making during combat operations.[10]

Notes

[1] A View from the Top. Airmen Magazine. Dec 98, Vol 42 Issue 12 Pg. 8.
[2] The Air Expeditionary Force, Looney, William R. Airpower Journal. Winter 96, Vol 10 Issue 4 p4.
[3] AFI 10-400, Aerospace Expeditionary Force Planning. HQUSAF/XOPE. 1 Oct 99.
[4] Expeditionary Aerospace Force, Detail Concept Paper, HQ USAF/XOPE EAF Implementation Division, 1 Oct 99, Pg 1.

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[5] Expeditionary Aerospace Force, Detail Concept Paper, HQ USAF/XOPE EAF Implementation Division, 1 Oct 99, Pg 1.

[6] Television Interview: Flight Path – "Air Strike", Discovery Channel. September 1998.

[7] U.S. Army FM 100-5. Headquarters U.S. Army. June 1993.

[8] Joint Pub 3-0. Washington DC. 1 Feb 1995.

[9] Joint Pub 3-0. Washington DC. 1 Feb 1995.

[10] U.S. Army FM 100-5. Headquarters U.S. Army. June 1993.

Part 3

New Technologies

Theater Battle Management Core System (TBMCS)

Theater Battle Management Core System (TBMCS) is a Command and Control (C2) information system that provides the Joint Force Air Component Commander (JFACC) and subordinate staffs with an integrated set of software applications for planning and executing joint air operations. TBMCS will also be the core system for all deployed units. TBMCS integrates legacy air combat automation efforts (including the Contingency Theater Automated Planning System (CTAPS), the Wing Command and Control System (WCCS), the Combat Intelligence System (CIS), and the Air Support Operations Center (ASOC) Modernization program) under a single program.[1] The system is built with a single battle management system architecture built on the Defense Information Infrastructure Common Operating Environment (DII COE). Force Level TBMCS supports the JFACC operational mission regardless of service, including "JFACC Afloat" operations aboard a Navy command ship. Unit Level TBMCS is the execution arm of TBMCS responsible for receiving tasking from higher headquarters, translating the tasking into a unit flying schedule, executing the flying schedule, and reporting the results. Built within TBMCS is a collaborative work environment. Video, voice, shared whiteboard applications, and chat will all be functions that will allow real-

time communication between users from throughout the AOR and throughout the world. TBMCS also provides special vehicle-mounted computers and communications to ASOCs. All three levels are supported by a wide range of common software, such as basic targeting and mission status monitoring software and displays of the common operational picture (COP). The COP is a real-time display for all users showing the current air, sea and land picture. The amount of inputs from data links, Joint Tactical Information Distribution (JTIDS), Link-16, TADIL A and TADIL J and the upcoming Fighter Datalink (FDL) and Air Traffic Control (ATC) inputs are the only limits to how much traffic can be displayed. Each TBMCS installation will also include specialized applications unique to a type of unit, such as the Close Air Support Tool (CAST) used at the ASOC to task and monitor CAS missions. TBMCS "Remote" terminals, using a Web browser interface, provide similar capabilities to command and control nodes that are airborne, allowing limited communications or computer support, and require a small footprint system. These remote terminals can receive, filter, and sort tasking as well as monitor and update the status of air missions, essential to airborne operations.

The objective of the Theater Battle Management Core Systems (TBMCS) is the establishment of a common, responsive joint air command and control automation environment. The goal is seamless planning and execution of military air operations theater wide, including common air C2 applications across all services, and integration with GCCS. This also applies to vertical integration among all echelons (eg, AOC, ASOC, Unit) with common applications and distributed databases. It is this vertical integration which is essential to the responsiveness and versatility of the On-call AEWs. TBMCS through the collaborative elements will also allow visibility to the Air Tasking

Order process. Insight into the Joint Integrated Prioritized Targeting Listing (JIPTL) and the Joint Forces Commander and JFACC intent and objectives. The importance of this will be discussed under commander's intent and mission-type orders.

Joint Mission Planning System (JMPS)

JMPS will comprise a flexible family of systems for mission planning of airborne assets based on a common architecture. The JMPS architecture will comprise a flexible, scaleable and extensible framework, extended by shared components that are specific to mission planning. The framework will facilitate evolution of JMPS components to provide the mission planning capabilities for new/improved aircraft, weapons and sensor systems and operations.[2]

JMPS capabilities will be responsive to needs of diverse users, DOD aircraft, weapons, sensor systems, and operations, to support planning/selection of mission-optimal routes. JMPS is to be simple and efficient to use. JMPS will allow mission planning to be completed, rehearsed and ready to be briefed within 2 hours, optimally within 30 minutes, thus increasing the responsive capability of the AEW.[3]

JMPS will reside as a software module on Global Command and Control System (GCCS) which is integrated with TBMCS. Therefore, TBMCS will also have the ability to be a strike-planning platform. The JMPS capabilities are tailorable to meet unique needs of planners and aircraft avionics. JMPS supports pre-planned missions as well as immediate mission planning. JMPS is being designed to be the mission planning system for all Department of Defense airborne assets. Hence, the JMPS will be adaptive to different users and easy to update and modify. JMPS operates under diverse constraints for a wide range of users.

JMPS functions on a variety of computer hardware configurations. From laptops with minimal computing resources (e.g., processor speed, available RAM, and disk drive space), through mid-range desktop systems to high-end systems (e.g., multi-processor workstations) with substantial computing resources. JMPS will support stand-alone, as well operate on a network system, both secure and unsecure. Flight Planning will be done in a collaborative arena. Multiple planners from any location tied into the network will be able to mutually visualize, share, and modify imagery, targeting data, route plans and intentions. This capability not only allows the user to interface and exchange Air Tasking Orders, Airspace Coordination Orders, mission plans, routes, and other support data, but also to jointly plan complex combat and strike missions. This same capability will allow users throughout the chain of command to visualize strike sorties and verify intent and objectives are being met. JMPS should provide Force-Level Decision Support interfaces for facilitating concurrent planning, collaboration and flow of information between echelons of a Joint Task Force and inter-service components. It provides tools for target selection, allocation of weapons to targets, position and intended movement of mobile platforms, and aircraft/cruise missile/gunfire deconfliction. JMPS should be able to link to existing and planned command information networks to exchange data with distributed elements of the force at the unit, multi-unit strike and force-level.[4] The exchanged data should include mission data, intelligence, weather, ATO, force package coordination, tactical deception, and other feeds.

Enroute Expeditionary Operations Center (EEOC)

The Enroute Expeditionary Operations Center (EEOC) is a system built for the 366WG during Expeditionary Force Experiment 98 (EFX 98) and re-evaluated during

Joint Expeditionary Force Experiment 99 (JEFX 99). Modifications were made to a KC-135R (See Figure 3) allowing the use of a special pallet configuration enabling the AEW/CC to exploit situational awareness, threat avoidance, targeting updates, weather, mission planning, and complete network communication reporting while enroute to an AEW bed-down base. The system is designed to ensuring minimal communication down time during the preparation, deployment, and employment phase for the on-call AEW. The concept of operations for the pallet is to have it loaded on the first tanker to deploy from the on-call AEW. The passengers on board the tanker would constitute the first strike force for the AEW. Aircrews, Intel, maintenance personnel, security personnel, logisticians, contracting and wing leadership on board the tanker would use the communication capability to enhance battlespace awareness. The EEOC is composed of (1) a communication and computer equipment on a standard cargo pallet (See Figure 4 and 5); (2) a modified KC-135R providing power, antennas, and connecting cables; and (3) a full network capable mission planning table.
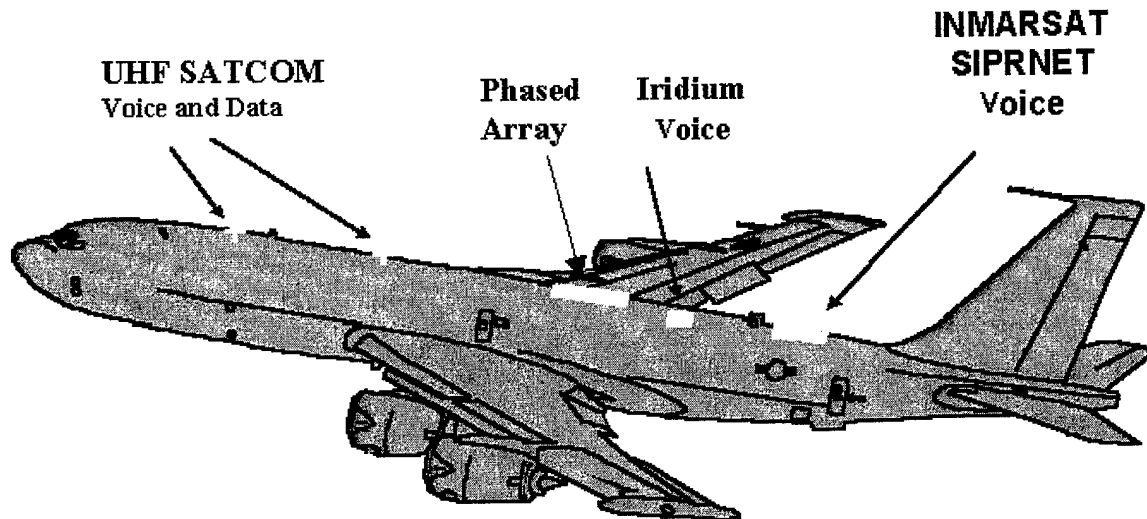
UHF SATCOM
Voice and Data

**Phased
Array**

**Iridium
Voice**

**INMARSAT
SIPRNET
Voice**

Figure 2. KC-135 External Modifications

The EEOC Pallet is equipped with the following:

1) UHF SATCOM –A limited bandwidth, Beyond Line of Sight (BLOS) communication system used for both voice and data transmissions.

2) Combat Track II (CTII). CTII is an in-transit visibility system, which runs through the computer systems on the pallet. Allows e-mail updates and GPS flight following to other CTII users. The system was used extensively by the B-1Bs and B-52s during Operation Allied Force. (see Appendix B)

3) Iridium – BLOS, currently unsecure, commercial-off-the-shelf (COTS), system used for voice only. Phone connections are available at the EEOC pallet and also at the mission-planning pallet.

4) Phased Array Antenna (PAA)– A high bandwidth, receive only system which also allows reception of Direct TV broadcasts, video feeds for videoconferences, large data transmissions. Approx. 13 MBps one way into the EEOC Pallet.

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5) INMARSAT – COTS system that allows secure communication via phone systems. The multi-channel capability allows several voice channels or a duplexed data channel that allows secure data rates from the aircraft approaching 28.8 KBps. Combined with the PAA allows the EEOC pallet to operate at approx. 56 KBps combined data rate while airborne. In other words, while airborne over the EEOC is able to download, process and transmit at rates comparable to home station.

6) UNIX and PC workstations – The EEOC pallet contains three high end personal computers running windows NT and three Unix systems operating TBMCS and JMPS. The NT machines also run some of the same collaborative tools associated with TBMCS allowing file sharing, White Board, Video and voice over the network. The system give the AEW/CC the ability to reach forward to the Forward Operating Location (FOL) and reach back to United States for information.

This equipment array is essential because it provides the planners the ability to plan the first strike mission prior to arrival in the AOR. Imagery can be passed, the COP can be used to present real-time air pictures and enemy order of battle can be received to allow Intelligence Preparation of the Battlefield. The ATO can be received via TBMCS or specific instructions (mission-orders and commander's intent) can be relayed from the AOC. The ability for the AEW/CC to be in continuos contact with the JFACC and verify objectives, receive JIPTL, and gain a better understanding of the JFACC's intentions. Through JMPS strike planners have the ability to rehearse the mission through fly through simulations, prior to arriving at the Forward Operating Location (FOL). Deployed forces will gain full spectrum dominance by coordinating logistics, munitions,

force protection issues, POL issues while enroute and in full collaboration with home, the FOL and any other outside agency required to ensure dominant battlespace knowledge. Key to the ability of the EEOC is the coordinating functions between the Air Operations Center (AOC), JFACC and the AEW providing seamless integration between the wing's information and mission planning functions.
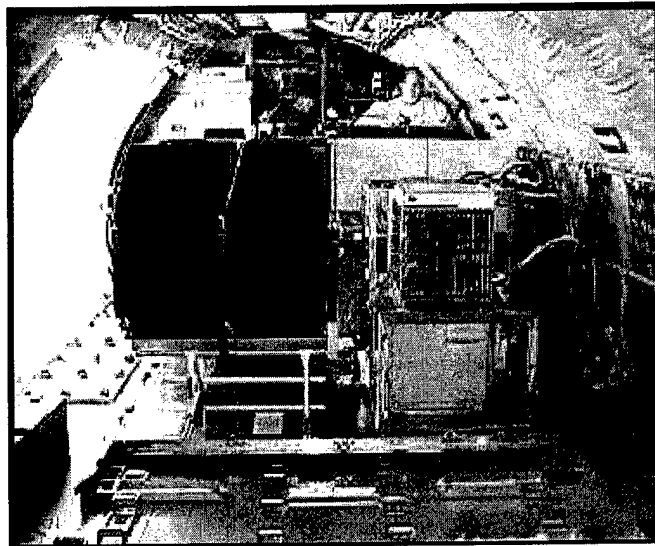

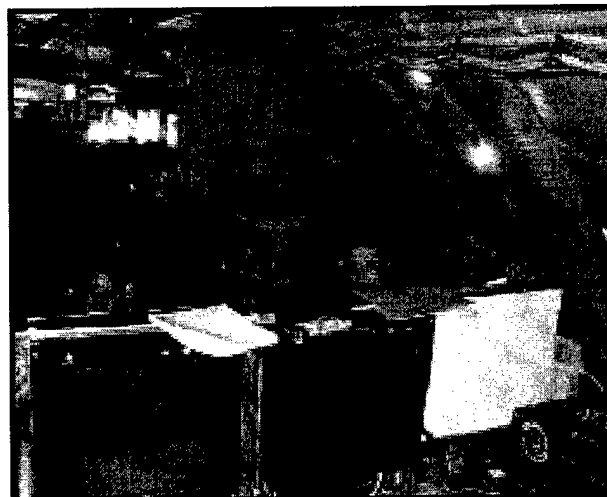**Figure 3. EEOC Positioned For Flight**

Figure 4. EEOC Inflight

Upon arrival at the Forward Operating Location (FOL) the pallet is downloaded from the KC-135 and placed in a sheltered area (See Figure 5). Total down time from system shutdown to system return is optimally 1 hour. The present communications package takes about 20 to 25 personnel, three to four pallets of equipment, and about four days to be completely setup.[5] With current commercial and government systems onboard the pallet, the AEW Commander is never out of touch with home or with the JFACC. In addition to all of the communication capabilities airborne, the pallet also is used for secure line of sight communication once on the ground.

Figure 5. EEOC Setup at Forward Operating Location

Notes

[1] Theater Battle Management Core Systems [TBMCS] Theater Battle Management Core Systems [TBMCS], Command and Control Training and Innovation Group Web site. http://ac2isrc.acc.af.mil/warfighter/ProgProj.asp?progproj=4.

[2] Joint Mission Planning System (JMPS) system / subsystem specification JMPS-SSS 1.0. 15 Nov 1999. Naval Air Systems Command and Electronic Systems Center. Hanscom AFB, Ma.

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[3] Joint Mission Planning System (JMPS) system / subsystem specification JMPS-SSS 1.0. 15 Nov 1999. Naval Air Systems Command and Electronic Systems Center. Hanscom AFB, Ma.

[4] Joint Mission Planning System (JMPS) system / subsystem specification JMPS-SSS 1.0. 15 Nov 1999. Naval Air Systems Command and Electronic Systems Center. Hanscom AFB, Ma.

[5] Senior Airman Dan Bernath, MEDFLAG Public Affairs. *"New Communications System Gets Test Drive in Cameroon"*. Air Force News, 13 Mar 2000.
http://www.af.mil/news/Mar2000/n20000313_000388.html

Part 4

Organizational Change

Air Expeditionary Force (AEF) deployments are no longer a new concept but a reality for today's military. AEFs range from wings to squadrons in size but work the same no matter where located or size of the force. The 366th Wing has already been a part of three AEFs, prior to the implementation of the current EAF system, and was the sole unit during the earlier AEFs V and VII. In AEF V the Gunfighters also had the distinction of not only being the first single wing AEW but also having the first ever combat ORI in ACC. Even though these AEF deployments would actually be termed AEW deployments under current definitions, one of the primary driving factors in their early success was the Expeditionary Operations Center or EOC.

The concept of the EOC originated in 366 OSS/OST during the short notice preparation for AEF V to Bahrain in August of 1997. The idea was to create a central, cooperative operations center that could combine the expertise, connectivity, and energy of the different war fighting elements within the wing into a single, rapidly, synergistic deployable center. The goal was to model the EOC after an Air Operations Center (AOC) but also have it tailorable in size to fit an Air Expeditionary Wing (AEW), Group (AEG), or Squadron (AES) size deployment, be it a fighter/bomber unit, TALCE, or Special Operations.

The Expeditionary Operations Center is NOT a Wing Operations Center

The EOC is **_NOT_** a Wing Operations Center or WOC. The EOC is much more than that. The EOC is a single point for conducting operations at a deployed location under austere conditions. Rapidly deployable, tailorable, single source operations center that includes all the command, control, information, and combat elements necessary for an expeditionary force to effectively prosecute the ATO and ensure base survivability. It is also the central location for the AEW/CC to direct, control, coordinate all AEF assets under his authority. Additionally, integration and operations with the Army's Patriot Defense Battery is contained in the EOC.

EOC personnel are responsible for planning, executing, and assessing Air Tasking Order directives as well as directing and coordinating base survival and sustainment operations. A complete list of responsibilities for the EOC are listed in Appendix A. The EEOC pallet is the cornerstone for the entire Expeditionary Operations Center and provides the foundation for all other functions.

The EOC has four divisions with eight core teams, three specialty teams, and two support teams. EOC team concept represents a wide range of systems and capabilities. Divisions are organized and integrated within EOC to support the AEW/CC. Teams should be flexible, with an emphasis on integration of capabilities and synergy of effort. Through the use of the TBMCS each division is tied to together allowing sharing of data, information and intelligence within the EOC and full reachback to any other connected agency.

The EOC Director is charged with facility setup, integration, and effectiveness of air operations (an example of an EOC is shown in Appendix C). The EOC Director focuses

on planning, coordinating, and executing ATO. The EOC director has responsibility to ensure all EOC functions necessary to complete air planning and execution process, are executed in a timely, efficient manner.

Combat Plans and Information Systems Divisions each has two core teams. Teams in Combat Plans Division are ATO Plans Team and Mission Planning cell (MPC) Team. Information Systems Team has Intelligence Team and Weather Team. Combat Operations Division has two core teams of Current Operations and Wing Scheduling. Command and Control Division has five core teams. These are Command Post (CP), Maintenance Operations Center (MOC), Battlestaff Director, Survival Recovery Center (SRC), and Logistics Readiness Center (LRC). Core Teams drive planning, execution and the base survivability process. (See Figure 6)
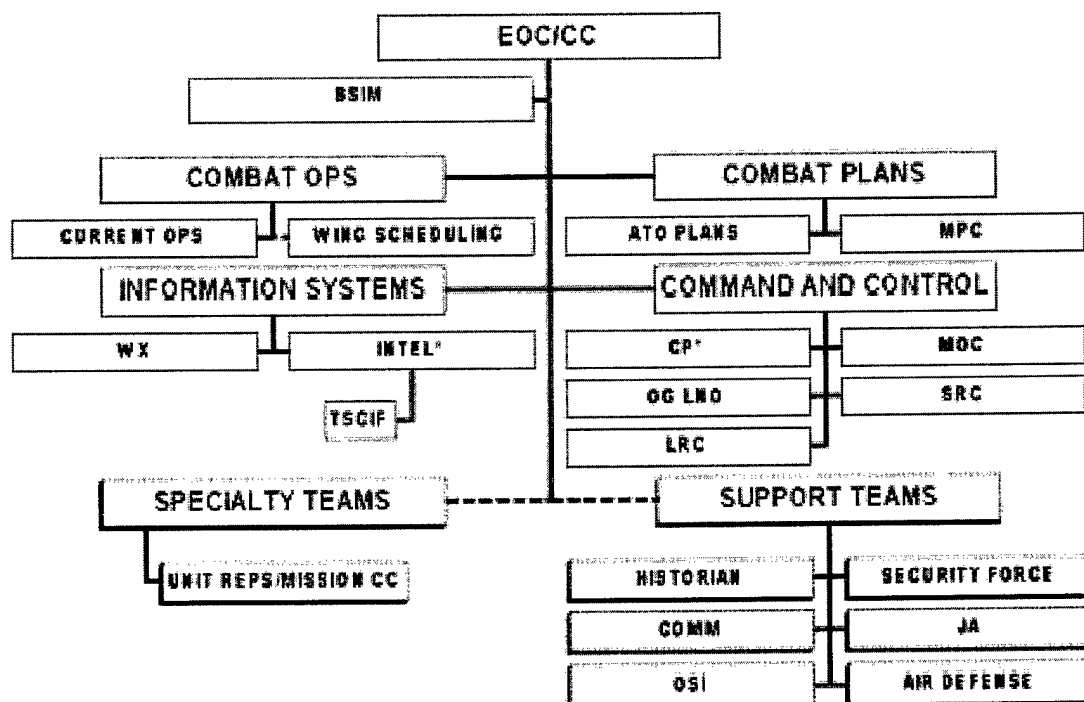

Figure 6. Organizational Chart for Expeditionary Operations Center

Core teams have functional experts under direction of a single team leader. A core team operates with a common purpose to achieve unity of effort. It is important to understand that the central EOC process is planning and execution of wartime taskings. Core teams are owners of this process and everyone in EOC supports it. The goal of the team is to create a cooperative, barrier-free environment focused on mission accomplishment.

Combat Plans Division is responsible for near-term air and space operations planning function of EOC. This division develops ATO mission planning process and develops schedules to meet ATO tasking based on guidance from AOC and EOG/CC. Combat Plans receives ATO from AOC and disseminates it throughout EOC for planning and execution. Combat Plans Division is normally comprised of two teams: ATO Plans Team and MPC Team. ATO Plans Team is responsible for receiving, disseminating, and making changes to the ATO. Team members are the sole link to the AOC for ATO changes or requests. ATO Plans Team should be the primary source of direct communication to the ATO plans section within the AOC. Plans are the central liaison for mission planning functions should no dedicated planning team be needed or deployed. All ATO Plans Team members are fully trained in the use of TBMCS and JMPS. Upon completion of the planning the Combat plans team transfers responsibilities for completed missions to Combat Operations Division for sortie execution.

Mission Planning Cell (MPC) is charged with leading the mission planning process for the AEW. Team blends daily EOG/CC guidance, ATO fragged assignments, and asset availability to produce a complete, composite mission package. MPC works closely with ATO Plans Team to ensure most current ATO change is obtained and to request

changes to the ATO from the AOC. MPC Team will normally be comprised of a team chief and mission planners from each of flying squadrons.

Combat Operations Division executes the ATO. They are also responsible for tracking an ATO after release by supported JFACC. Current Operations team within Combat Operations runs current days' flying schedule in support of the ATO. Combat Plans delivers all applicable mission data to Current Operations team 12 hours prior to next day launch for execution of ATO. Current Operations adjusts the tasked missions as necessary in response to inputs from the JFACC due to battlespace dynamics (e.g., assigned targets are no longer valid, higher priority targets are detected, enemy action threatens friendly forces). Monitors and recommend changes to defensive operations and provide feedback on status of current ATO. Current Operations will also monitor the Common Operational Picture (COP) in Global Command and Control System (GCCS) and inform EOG/CC and/or EOC Director of critical situation updates.

Information Systems Division is responsible for timely, accurate, and up to date information dissemination within EOC. The division is normally comprised of two core teams, Intelligence Team and Weather Team.

The Intelligence Team is responsible for collection and reporting of all intelligence information to AOC. Additionally, responsible for dissemination of intelligence information to all EOC personnel, aircrew, and command staff. Combat Intelligence provides intelligence summaries and Intelligence Preparation of the Battlefield for conducting short and long range planning. Combat Intelligence also provides updates, analysis, and recommendations to Combat Plans for decisions on planning and executing the current ATO, while providing unit support to tasked squadrons.

The Weather team is responsible for accurate weather forecasts and current observations in support of AEW operations and base personnel. Weather Team will deploy capability to support all types of sensor and weapons predictions.

The Command and Control Division ensures base survivability, aircraft generation and status, and wing status reporting. Division is comprised of Command Post (CP) Team, MOC Team, Battlestaff Briefing Team, SRC, and LRC.

The CP oversees communications from the AEW with outside agencies, base survival Giant Voice system, and Wing status reports. The Maintenance Operations Center (MOC) Team coordinates aircrew generation and status. The Survival recovery Center (SRC) becomes a command and control element for the AEW when exercised or deployed to a contingency location. SRC handles base-defense, post attack recovery operations and is a control center for handling potential disasters and major accidents in a deployed location. The Logistics Readiness Center supervises reception, beddown, maintenance and resupply of AEW equipment and munitions to successfully employ operations in exercise or deployed AOR. The LRC works closely with the TALCE coordinating incoming airlift.

Specialty teams provide EOC diverse capabilities to help orchestrate AEW air power. Many of these capabilities are provided to EOC from agencies external to EOC organization. It is crucial to success of the AEW that these capabilities be interwoven into ATO planning and execution process. One specialty team currently used and deployed with EOC is unit representatives and Mission Commanders. Unit representatives and Mission Commander Specialty Teams provide the principle planning

element and works in conjunction with Combat Plans Division to build mission profiles to meet the JFACC objectives per ATO guidance.

Support teams provide the EOC additional diverse capabilities, but are external to the ATO execution process. Each team is essential to the operation of the wing and the EOC but generally only have limited inputs to ATO execution. Six Support Teams are identified: Wing Historian, Security Forces, Communications, Air Defense, Judge Advocate, and the Office of Special Investigations (OSI).

The organization of the EOC is essential to the operation of the on-call AEW. The synergy of effort allows flexibility and speeds the flow of information throughout the AEW. Tied with the new technologies, mentioned earlier, the EOC organization enables the AEW to assimilate information and to easily meet the high demands of a combat deployment. The receipt of the ATO from Joint Forces Air Component Commander (JFACC) via TBMCS, through developing a 24-hour mission-planning cell (MPC) to support contingency operations, the EOC is based on the fact that aircrews (particularly mission commanders) will have minimal time to plan strike packages. Team members (including Combat Intelligence) review targets, build threat avoidance routes and neutralization plans, inter-package relationships and support requirements, as well as detailed timelines for strike packages. Supported by the new technologies, the entire process from ATO reception to completed mission package with the use of JMPS should be less than two hours.

Part 5

Doctrinal Change

Commander's Intent and Mission-type Orders

The Air Force has not doctrinally embraced the concept of commander's intent down to the wing level. The United States Air Force is task driven through the Air Tasking Order. Airmen learn to drop weapons, deliver cargo, and air refuel aircraft by accomplishing tasks not by achieving objectives. The Air Force does not fully accept the concept. Very few references to commander's intent fall within Air Force Doctrine Document (AFDD)-1 or AFDD-2. When commander's intent or intent is mentioned it falls onto the Joint Forces Air Component Commanders as the executor of the Joint Forces Commander's intent. The Army, Marine Corp, Navy and Joint publications make substantially more utilization of commander's intent than the Air Force. (See Table 1)

The combat organization of the current Air Force does not rely of air wing organization to provide battlefield control. Airpower relies heavily on the foundation of centralized control at the highest levels to ensure the firepower that the air force brings to the fight is concentrated on the priority targets. This centralized control is the theater level planning, coordination and direction which focus available aerospace power on the key nodes of the enemy, reaping the greatest benefits in pursuit of the JFC's objectives. This current system prevents the development of subordinate level commander's intent.

Procedural employment of commander's intent would clearly enhance the ability of the AEW to respond to a crisis and apply airpower where needed.

Table 1. Commander's Intent in Doctrinal Publications[1]

Publication	Title	Number of References
	Army	
FM 100-5	Operations	22
FM 100-7	The Army in Theater Operations	20
FM 1-100	Principles of Army Aviation Combat Operations	12
FM 101-5-1	Operational Terms and Graphics	7
	Marine Corps	
MCDP-1	Warfighting	5
	Navy	
NDP-1	Naval Warfare	10
NDP-6	Naval Command and Control	17
	Joint Publications	
JP 3-0	Doctrine of Joint Operations	17
JP 1	Joint Warfare of the Armed Forces of the U.S.	4
JP 2-0	Joint Doctrine for Intelligence Support Operations	7
JP 5-03.1	Joint Operation Planning and Execution System	3
	Air Force	
AFDD 1	Basic Aerospace Doctrine	2
AFDD 2	Organization and Employment of Aerospace Power	4
AFDD 1-2	Air Force Glossary	0
AFDD 2.1	Air Warfare	5

Technologies and organizational change brought about by the Revolution in Military Affairs has brought the Air Force to a point in which the On-call AEWs should be given the ability to use commander's intent and exploit the mission-type order. Commander's intent and mission-type orders are already joint procedures that the Air Force must understand and utilize for effective interservice operations. The AOC production cycle

of up to 72 hours to produce an ATO is inadequate for the current state of the battlespace[2]. The inflexible nature of the ATO timeline, as discussed by Admiral Murphy, means lost opportunity, targets missed and the loss of flexibility to the On-call AEW. Commander's intent allows the intermediate-level commander to fully harness initiative and use the flexibility and versatility inherent in airpower. This is not saying that the Air Tasking Order should be eliminated. The ATO provides an administrative function of aircraft deconfliction, tasking of ISR assets and provides for the dissemination of targeting information to outside agencies which is essential for large scale operations.

The key to commander's intent is the ability of the commander at all levels to have as much understanding of the battlespace, as does the JFACC and the JFC. The ability of TBMCS and JMPS to spread information and knowledge through their collaborative work environments to all levels of command gives the AEW/CC the ability to prepare the battlefield using his intelligence assets deployed with him. The Enroute Expeditionary Operations Center allows constant contact with the JFACC and the AOC staff with the deploying AEW/CC.

The On-call AEW Commander should have a better understanding of his unit's capabilities and limitations then the upper echelon of command. This knowledge will allow him to better utilize the composite nature of his AEW forces producing a synergistic effect far superior than the coordination achieved through the ATO. The EOC gives the AEW/CC the wartime organization, which can build upon the commander's intent and produce a viable plan for striking a group of targets.

The Information Required

But what external information is required for an on-call AEW unit to plan a strike mission? The answer is very simple. The wing needs to understand the limiting factors associated with airspace, so an airspace coordination order (ACO) would be needed from the Air Operations Center. Next, the wing needs to coordinate intelligence, surveillance, and reconnaissance assets, since these assets do not belong to the on-call AEW. The wing needs a clear understanding on what needs to be targeted, and this can be derived through the Joint Integrated Prioritized Target Listing (JIPTL). In addition, the AEW will need to understand the objective to be accomplished. Mission-type orders can clearly give the AEW the idea of what needs to be done, without going too far as to how. The JFACC can supply the commander's intent, simply because the commander's intent from the JFC to the JFACC should be understandable two levels down, i.e. the AEW level. Airspace coordination, ISR allocation, threat information, logistical concerns, support data, and intelligence data can be obtained through TBMCS modules and planned using the JMPS software.

Notes

[1] From approved joint publications and selected publications produced by J-7, Joint Staff, Joint Electronic Library.
[2] Joint Pub 3-56.1. Command and Control for Joint Air Operations. J-7, Joint Staff. 14 November 1994.

Part 6

The Strike on Podgorica

By utilizing the on-coming technologies and existing technologies (TBMCS, JMPS, EEOC), the wartime organizational infrastructure of the EOC, combined with the use of commander's intent and mission-type orders readdress the attack on Podgorica Airfield. By adding additional constraints, the challenge of striking the target increases. Instead of day 14 of the war, the scenario begins with day one. The JFC asks the same question to the JFACC. "We need to strike Podgorica airfield now. I want it shut down. Can the Air force do the mission?" The response is different this time, because the on-call AEW has been sent into the AOR. The JFACC responds with a clear and precise "Yes." He immediately picks up his phone and calls the AEW/CC. The connection is seamless and the JFACC is soon talking with the AEW/CC who is currently over the mid-Atlantic talking on a secure phone connected over a commercial INMARSAT. Still four hours from landing the first contingent of the AEW begins the mission planning process without ever seeing the ATO. The commander's intent is clear. The final end- state is to destroy Podgorica airfield. While enroute Intel has begun to download the order of battle and imagery, munitions personnel are determining capability at the forward base, and mission planners start detailing routing.

Two hours later, and still one and a half-hours prior to descent, the mission planning is completed, the aircrews have rehearsed the package for coordination errors and deconfliction. Through a collaborative planning session over the Joint Mission Planning System, the Mission Commander has briefed the ISR assets on the mission and coordinated with the Navy EA-6B assets. The AEW/CC is now beginning a video teleconference with the JFACC, detailing the plan as the aircrews begin to rest. The Logistics representative has talked with the TALCE over Voice SATCOM and given them an update on arrival time and requirements. The security forces representative has also talked with the 820th Security Forces Group (SFG) detachment at the FOL and has reviewed three-dimensional imagery of the location using software modules within TBMCS. Upon landing, the mission package is complete, force protection issues have been resolved, and weapons are being prepared for uploading on the incoming fighter aircraft. Within one hour after landing, the Enroute EOC pallet has been downloaded and is setup and operating from a host nation hangar. Full connectivity through voice, data and fax is available. The fighters, bombers and additional tankers arrive 4 hours after the Enroute EOC. Six hours later a package of aircraft launch from the AEW and decimate Podgorica airfield. Twenty four JDAM and 8 GBU-10's destroy the infrastructure of the base while F-16CJs launch several Highspeed Anti-Radiation Missiles (HARMs), completely disabling the Surface to Air threat. Providing top cover are F-15Cs and the entire package is observed within the EOC and the AOC over the TBMCS Common Operating Picture (COP). The mission is a complete success while crews and planners never see an ATO. Commander's intent and the mission objective tied to a target are all that was required.

That is how an Air Force embracing the RMA can utilize new technologies and new conceptual organizations to meet the commander's intent. Chief of Staff of the Air Force, General Ryan, has seen the EEOC at work during JEFX 99 and has recommended full implementation of the EEOC at the two On-call AEW locations.[1] In addition, The Command and Control Training and Innovation Group (C2TIG) has been chartered to establish a detachment at Nellis AFB, NV. This detachment will be used to train aircrews and AEW leadership on the proper use of the Expeditionary Operations Center.[2] The new EOC facility at Nellis AFB would allow deploying aircrews and leadership a chance to see the proper setup and use of the EOC. This time and location, within the semi-sterile environment of Red Flag, would also be an excellent chance to introduce mission-type orders and commander's intent to the operational airmen. Introducing to the Air Force at the tactical and operational level, something the sister services have embraced for a much longer time.

Notes

[1] JEFX –99 After Action Report, January 2000.
[2] Phone interview, Lt. Colonel Sam Cunningham, Chief of Staff, Command and Control Training and Innovation Group. Jan 16 2000.

Appendix A

The primary functions that reside within the EOC are:

1) Scheduling, tasking, and executing day-to-day air operations in support of ATO; provide rapid reaction, positive control, and coordinated integrated air power. This also includes daily Feasibility Capability (FEASCAP).

2) Receive, assemble, analyze, filter, and disseminate all-source intelligence and weather information to support air operations planning, execution, and assessment.

3) Issue base control procedures, alarm conditions, and control base survivability operations.

4) Disseminate and coordinate all ATOs and changes.

5) Generate and distribute base SITREPs.

6) Coordinate aircraft maintenance operations and sortie generation.

7) Maintain reachback with parent organization and AOC.

Appendix B

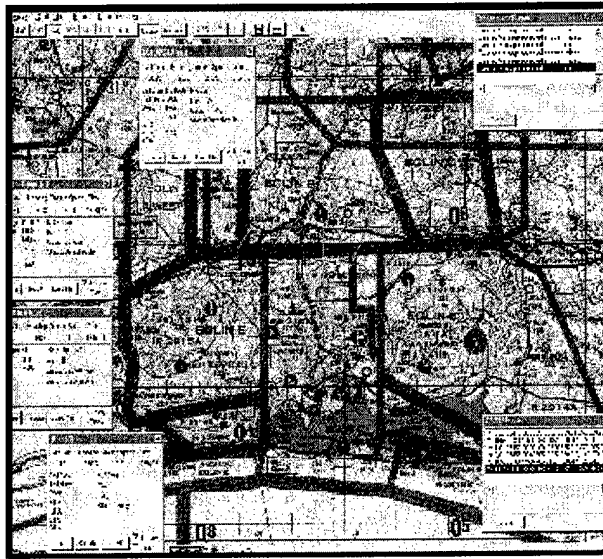The following are examples of Combat track II screens and setup on the EEOC pallet.
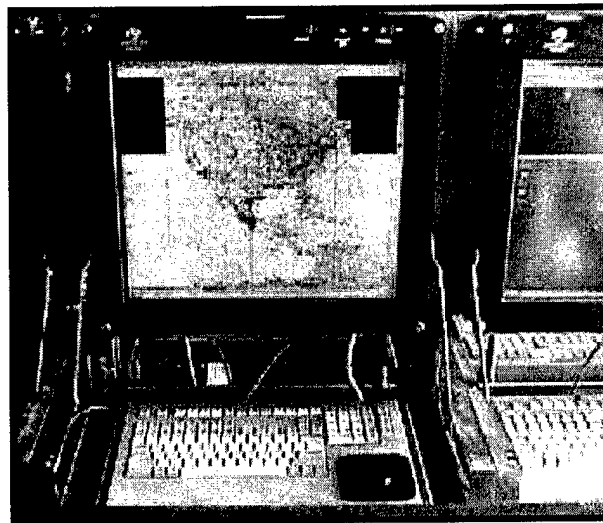

Figure 7. Combat Track II Screen
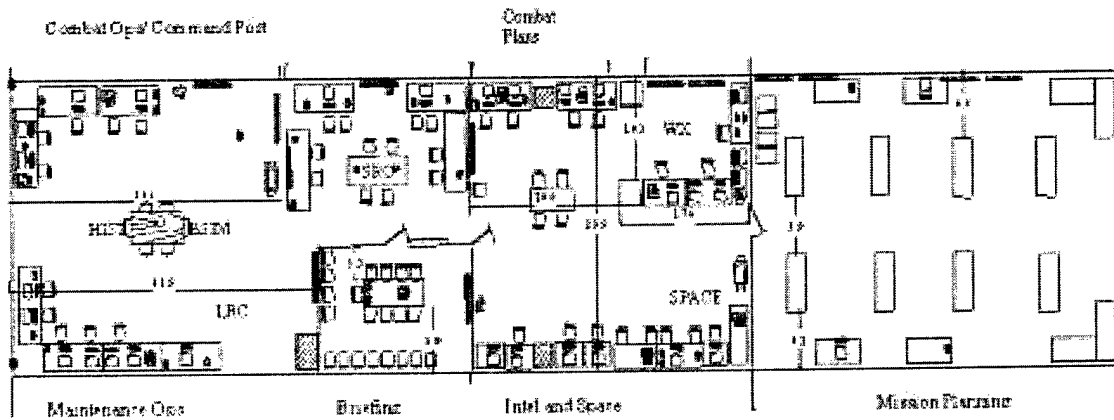

37

Figure 8. Combat Track II Setup on EEOC

Appendix C

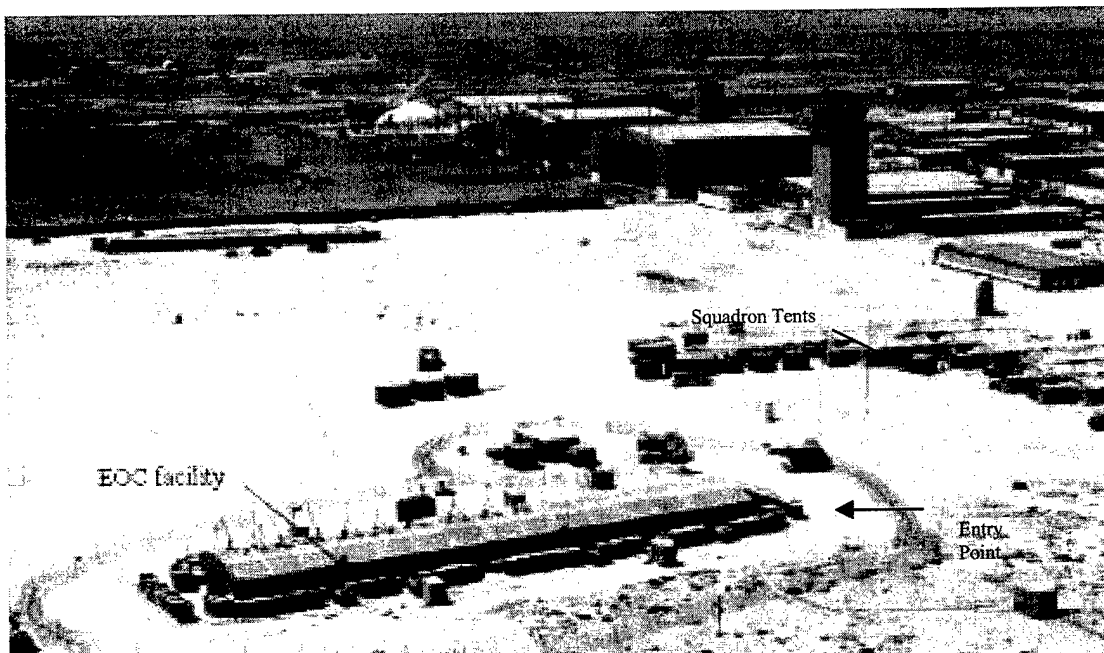**Figure 9. Expeditionary Operations Center (EOC) Layout for AEF VII**

Figure 10. View Of EOC during AEF VII

Glossary

ACC	Air Combat Command
ACO	Airspace Control Order
AEF	Air Expeditionary Force
AEW	Air Expeditionary Wing
AFDD	Air Force Doctrine Document
AOC	Air Operations Center
AOR	Area of Responsibility
ASOC	Air Support Operations Center
ASETF	Aerospace Expeditionary Task Force
ATC	Air Traffic Control
ATO	Air Tasking Order
BLOS	Beyond Line of Sight
C2	Command and Control
C2TIG	Command and Control Training and Innovation Group
CAST	Close Air Support Tool
CIS	Combat Intelligence System
COP	Common Operational Picture
COTS	commercial-off-the-shelf
CP	Command Post
CTAPS	Contingency Theater Automated Planning System
CTII	Combat Track II
DII COE	Defense Information Infrastructure Common Operating Environment
DOD	Department of Defense
EAF	Expeditionary Aerospace Force
EEOC	Enroute Expeditionary Operations Center
EFX	Expeditionary Force Experiment
EOC	Expeditionary Operations Center
FDL	Fighter Datalink
FOL	Forward Operating Location
GCCS	Global Command and Control System

HARM	High-speed Anti-Radiation Missile
INMARSAT	International Maritime Satellite
ISR	Intelligence, Surveillance, and Reconnaissance
JEFX	Joint Expeditionary Force Experiment
JFACC	Joint Forces Air Component Commander
JFC	Joint Force Commander
JIPTL	Joint Integrated Prioritized Targeting Listing
JMPS	Joint Mission Planning System
JTF	Joint Task Force
JTIDS	Joint Tactical Information Distribution
KBps	Kilobytes per Second
LRC	Logistics Readiness Center
MBps	MegaBytes per Second
MOC	Maintenance Operations Center
MPC	Mission Planning Cell
ORI	Operational Readiness Inspection
OSI	Office of Special Investigations
PAA	Phased Array Antenna
POL	Petroleum, Oils and Lubricants
RAM	Ready Access Memory
RMA	Revolution in Military Affairs
SATCOM	Satellite Communications
SFG	Security Forces Group
SIPRNET	Secret Internet Protocol Router Network
SRC	Survival Recovery Center
TBMCS	Theater Battle Management Core System
TALCE	Tanker Airlift Control Element
UHF	Ultra High Frequency
WCCS	Wing Command and Control System
WX	Weather

Aerospace (Air) Expeditionary Force. Composite organizations of aerospace power from which a tailored ASETF, composed of AEWs, AEGs (Groups), and AESs (Squadrons), is created to provide forces to meet theater commander in chief (CINC) requirements. An AEF is not a discrete warfighting unit. (AFI 10-400)

Aerospace Expeditionary Task Force. A tailored, task organized aerospace force presented to a joint force commander. An ASETF can be sized depending on the level and nature of the conflict and the size of the aerospace component required. (AFI 10-400)

Aerospace (Air) Expeditionary Wing. A wing or wing slice assigned or attached to an ASETF. An AEW is composed of the wing command element and some groups. (AFI 10-400)

Commander's Intent. Describes the desired end-state. It is a concise expression of the purpose of the operation and must be understood two echelons below the issuing commander. It is the single unifying focus for all subordinate elements. (FM 100-5)

Command and Control. The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. (Joint Pub 1-02)

Doctrine. Fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives. It is authoritative but requires judgement in application. (Joint Pub 1-02)

Expeditionary Aerospace Force. How the Air Force will organize, train, equip and sustain itself by creating a mindset and cultural state that embraces the unique characteristics of aerospace power-range, speed, flexibility, precision – to meet the national security challenges of the 21st century. (AFI 10-400)

Mission-type Orders. The commander's expression of what the unit must accomplish and for what purpose. Specifying what the subordinate commands are to do without prescribing how they must do it.(FM 100-5)

Reachback. The process of obtaining products, services, and applications, or forces, equipment, or material from Air Force organizations that are not forward deployed. (AFDD-2)

Reachbetween. The process of obtaining products, services, and applications from any organization while enroute to a forward deployed location.

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